

Claims:-

1. An isolated DNA molecule encoding an enzyme capable of hydrolysing at least one organophosphate selected from the group consisting of carboxylester organophosphates and dimethyl-oxon organophosphates,
5 the DNA molecule comprising a nucleotide sequence having at least 60% homology with Lc α E7, in which the protein encoded by the DNA molecule differs from E3 at least in the substitution of Trp at position 251 with an amino acid selected from the group consisting of Leu, Ser, Ala, Ile, Val, Thr,
10 Cys, Met and Gly.
2. An isolated DNA molecule as claimed in claim 1 in which the DNA molecule has at least 80% homology with Lc α E7.
- 15 3. An isolated DNA molecule as claimed in claim 1 or claim 2 in which the DNA molecule has at least 95% homology with Lc α E7.
4. An isolated DNA molecule as claimed in claim 1 in which the isolated DNA molecule has the nucleotide sequence shown in Figure 1 or a
20 sequence which hybridises thereto with the proviso that the protein encoded by the DNA molecule differs from E3 at least in the substitution of Trp at position 251 with an amino acid selected from the group consisting of Leu, Ser, Ala, Ile, Val, Thr, Cys, Met and Gly.
- 25 5. An isolated DNA molecule as claimed in any one of claims 1 to 4 in which the Trp at position 251 is substituted with Leu or Ser.
6. An isolated DNA molecule, the DNA molecule encoding a polypeptide having the amino acid sequence of RM-8Con shown in Figure 1
30 or the amino acid sequence of Md α E7 shown in Figure 3 in which Trp at position 251 is replaced with Ser.
7. A transformed cell which expresses an enzyme capable of hydrolysing at least one organophosphate selected from the group consisting of carboxylester organophosphates and dimethyl-oxon organophosphates, in
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which the cell is transformed with a DNA molecule as claimed in any one of claims 1 to 6.

8. A transformed cell as claimed in claim 7 in which the cell is a
5 prokaryotic cell or an insect cell.

9. An enzyme capable of hydrolysing at least one organophosphate
selected from the group consisting of carboxylester organophosphates and
dimethyl-oxon organophosphates, the enzyme being produced by a cell as
10 claimed in claim 7 or claim 8.

10. A method of eliminating or reducing the concentration of
organophosphate pesticide residues in a contaminated sample or substance
in which the organophosphate is selected from the group consisting of
15 carboxylester organophosphates and dimethyl-oxon organophosphates, the
method comprising contacting the sample or substance with an enzyme
encoded by the DNA molecule as claimed in any one of claims 1 to 6.

11. A method of eliminating or reducing the concentration of
20 organophosphate pesticide residues in a contaminated sample or substance
in which the organophosphate is selected from the group consisting of
carboxylester organophosphates and dimethyl-oxon organophosphates, the
method comprising contacting the sample or substance with a cell as
claimed in claim 7 or claim 8.

25 12. A method of producing an enzyme capable of hydrolysing at least
one organophosphate selected from the group consisting of carboxylester
organophosphates and dimethyl-oxon organophosphates, or an
enzymatically active portion thereof, the method comprising transforming a
30 host cell with the DNA molecule as claimed in any one of claims 1 to 6
operatively linked to a control sequence, culturing the transformed cell
under conditions which allow expression of the DNA sequence and
recovering the produced enzyme, or enzymatically active portion thereof.